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The Independent Influences of Relational and Physical Victimization on Subsequent Physical Aggression in Middle School Children

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LOYOLA UNIVERSITY CHICAGO

THE INDEPENDENT INFLUENCES OF RELATIONAL AND PHYSICAL
VICTIMIZATION ON SUBSEQUENT PHYSICAL AGGRESSION IN
MIDDLE SCHOOL CHILDREN

A THESIS SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
MASTER OF ARTS

PROGRAM IN CRIMINAL JUSTICE AND CRIMINOLOGY

BY

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ABSTRACT

Using Agnew's strain (1992) and integrative (2005) theory, this study hypothesized that relational and physical victimization would be independently associated with self-reported physical aggression at six months and one year after victimization. Secondary data analysis was conducted using three waves of a longitudinal multisite dataset used for the "Outcome Evaluation of the Teens, Crime, and the Community/Community Works (TCC/CW) Training Program, 2004-2005." Independent variables at wave one were relational victimization occurring none or one time (56.2%), or two or more times (43.8%), and physical victimization occurring none or one time (77.8%), or two or more times (22.2%). The dependent variables were physical aggression at waves two (63.6% No, 36.4% Yes) and wave three (72.1% No, 27.9% Yes). The control variables represented aspects of a youth's life such as school, self, family, community characteristics, and peers. The hypothesis was partially supported with a significant logistic regression model at wave two.

CHAPTER ONE

INTRODUCTION

Aggression in American schools has gained widespread attention among educators and academics. The term “bullying” has been used to describe overall physically and relationally aggressive conduct in schools. In the 2009 to 2010 school year, about 28% of students reported being victims of bullying (Robers, Zhang & Truman, 2012). The acts of bullying included: being made fun of; being called names, being insulted; being the subject of rumors; being threatened with harm; being pushed, shoved, tripped, spit on; being pressured to do things against one’s will; being purposely excluded from activities; and having had property intentionally destroyed. These relational and physical behaviors create an unpleasant and unhealthy learning environment that take a toll on the social well-being of children. As a result, victims and perpetrators of these types of aggression have been found to experience negative consequences such as anxiety, depression, truancy, continued violence, drug use (Skara, Pokhrel, Weiner, Sun, Dent, & Sussman, 2008) and delinquency (Farrington, Loeber, Stallings, & Ttofi, 2011; Ttofi, Farrington, Losel, & Loeber, 2011; Thornberry, Krohn, Lizotte, Smith & Tobin, 2003).

Addressing aggression in schools before it leads to serious outcomes should be a top priority among the more obvious stakeholders such as school officials and parents, and also among those behind the scenes such as policymakers and researchers. To effectively prevent a harmful school environment and harmful outcomes, researchers and

school administrators need to know more about the pathway of victimization to aggression. The literature in criminology has indicated it is possible that less serious forms of aggression are risk factors for more serious violence (Agnew, 1992; Agnew, 2005; Agnew, 2006; Loeber, Farrington, Stouthamer-Loeber, Moffitt, Caspi, Raskin & White, 2003; Loeber & Hay, 1997; Moffitt, 1997). The current study investigated the behaviors and factors that precede school aggression, because “aggression may be conceptualized as an escalating problem” (Loeber, 1982).

Defining Physical and Relational Victimization

Prior literature on has distinguished between two forms of victimization from peers: relational victimization and physical victimization in schools (Archer & Coyne, 2005; Cook, Williams, Guerra, Kim and Sadek, 2010; Crick, Casas & Ku, 1999; Nansel, Overpeck, Pilla, Ruan & Scheidt, 2003). Crick and Grotpeter (1995) were among the first to use the term “relational” to emphasize non-violent forms of victimization. Physical victimization includes being the target of physically aggressive actions such as hitting, kicking, shoving, punching, and slapping another. On the other hand, relational victimization includes being the victim of any of these relationally aggressive behaviors:

gossiping, spreading rumors, backbiting, breaking confidences, criticizing clothes and personality behind one’s back, ignoring, deliberately leaving others out of the group, social ostracism/exclusion, turning others against the victim, becoming friends with another as revenge, imitating behind one’s back, embarrassing one in public, anonymous jokes, practical jokes, abusive phone calls, dirty looks, huddling, or rolling one’s eyes at another. (Archer & Coyne, 2005, p. 216)

Crick and Grotpeter (1995) showed that relational aggression is an independent and separate construct from overt physical aggression. It is more emotional,

manipulative, and less detectable than physical aggression (Crick, 1996). It is more covert and requires the use of good social skills, so victims may not initially react in a physical way as a result of being victimized (Nui, 2009). For these reasons, it is often overlooked and not considered criminal conduct by teachers and parents, despite the fact that it has been shown to pose equally serious harms as physical aggression (Duke, Pettingell, McMorris & Borowsky, 2010). Such harms include somatic complaints (Crick, Ostrov, Burr, Cullerton-Sen, Jansen-Yeh, & Ralston, 2006), social psychological maladjustment (Crick et al., 1999), peer rejection (Crick, 1995), violence, chronic victimization, and delinquency (Crick et al., 2006; Ericson, 2001; Olweus, 1993; Wallace, Patchin & May, 2005). Victims of both types of aggression typically experience higher anxiety, poorer social skills, dysfunctional relationships, substance use, worse grades, an increased likelihood of carrying weapons (Duke et al., 2010) and chronic victimization (Graham, Bellmore & Mize, 2006; Ttofi et al., 2011).

Prior research has focused less on the effects of relational victimization, and the present study focuses on disentangling the effects of relational victimization and physical victimization on subsequent physical aggression. Agnew's (1992) strain theory and general theory of crime and delinquency (2005) served as the theoretical framework that identified the necessary control variables and explained why victimization led to subsequent aggression.

Theoretical Foundations

Agnew's (2005) integrated theory incorporated general strain theory (Agnew, 1992), which focused on how strain produces crime. Strain, which is a state of frustration,

occurs through many sources, including the “failure to achieve positively valued goals, the possible or actual loss of positively valued stimuli such as stressful life events, and the presentation of noxious stimuli to individuals such as emotional and physical abuse, criminal victimization, or discrimination” (Agnew, 1992, p. 50). When confronted with any of these sources of strain, individuals experience frustration that leads to other negative emotions such as anger, fear, anxiety, or depression, which in turn may contribute to delinquent acts. When external events such as victimization block goals or remove positively valued possessions, individuals may experience any of these negative emotions as a result (Agnew, 1992, 2005). Individuals harboring negative emotions produced by these situations may feel pressure to commit crime as a way of coping (Agnew, 1992).

Relational and physical victimization are sources of strain that lead to anger and other emotions. For example, by experiencing name calling, social exclusion, or physical injury by others, children are isolated from the positively valued goal of peer acceptance during adolescence (Crick, 1995). Agnew (1992) proposed that individuals engage in a variety of coping behaviors to deal with strain, including aggression, withdrawal, and depression. Using qualitative methods, Pronk and Zember-Gembeck (2009) found that following relational victimization, victims felt angry and responded with similar acts of name calling towards their perpetrators or other students. In this study, relational victimization motivated relational aggression, but this is not always the case.

Students may perceive their victimization differently, and cope in different ways. For example, victimized students have been shown to engage in avoidance behaviors

such as substance use, skipping class, or avoiding certain areas on school grounds, while other students cope in more serious ways (Duke et al., 2010). Peer victimization has been associated with physical aggression (Cullen, Unnever, Hartman, Turner & Agnew, 2003), delinquency (Agnew, 2002) and school delinquency (Wallace et al., 2005). Few studies, however, have separated the effects of different types of victimization on aggression.

CHAPTER TWO

LITERATURE REVIEW

Aggressive Behavior Following Victimization

Prior research has examined whether victims of bullying have a greater likelihood of engaging in bullying behavior (Ma, 2001; Nansel et al., 2003) or delinquency (Cullen et al., 2008; Duke et al., 2010; Wallace et al., 2005) following victimization. A few studies have partially addressed how victimization leads to aggression. Agnew (2002, 2006) conducted studies based on strain theory to address this question. Agnew (2006) found that physical peer victimization was a type of strain that resulted in delinquent behaviors such as stealing, using drugs, threatening people with weapons, and hitting people with objects; however, Agnew et al. (2002) did not find that peer victimization, measured as a single dichotomous item asking whether students had been picked on or bothered by older kids, significantly predicted delinquency. Nansel et al. (2003) found that being victimized by bullying, measured as unpleasant or teasing situations, increased the likelihood of delinquent behaviors, including carrying a weapon, frequent fighting, and injury from fighting. This study did not account for prior aggressive tendencies in examining the relationship between victimization and aggression. Thus, it is possible that the effect of bullying victimization on aggression in Nansel et al. (2003) is spurious, and reflects that aggressive individuals are more likely to be bullied and their aggression is continued.

Prior aggression is an important control in any study on the link between victimization and subsequent aggression. In addition to physical victimization affecting aggression, individuals with aggressive propensities may continue to commit aggressive acts across time, even if they are not victims of bullying. Agnew (2005) argued that prior crime may affect subsequent crime. Aggressors and victims once involved with crime are likely to be involved with it again. This continued involvement may not always be an immediate provoked response as a result of victimization, but may occur within the near or later future.

Studies have also shown that the stability of victimization and aggression over time occur in more dynamic, rather than static patterns (Burk, Armstrong, Jong-Hyo, Zahn-Waxler, Klein & Essex, 2011; Crick et al., 2006; Graham et al., 2005; Huizinga, Esbensen & Weiher, 1994; Tremblay, Masse, Perron & LeBlanc, 1992; Williford, Brisson, Bender, Jensen & Forrest-Bank, 2011). It is possible for children to act as aggressors, victims, or both at different points in time. Finding this to be true, Childs, Sullivan, & Gullledge (2011, p. 83) showed that changes in the age, risk seeking, parental attachment, and deviant peer behavior of adolescents aged ten to 19 were related to self-reported delinquency across five time waves. These predictors were not examined among different types of victims and aggressors.

Extending this research, Williford et al. (2011) found that fourth, fifth, and sixth graders transitioned between the roles of uninvolved, aggressive, victimized, and aggressive victim categories between grades. Therefore, Williford et al. (2011, p.652) concluded aggression and victimization in early adolescence should be regarded as

experiences or behaviors that occur in “episodes or spells,” which may be influenced by social, individual, or environmental factors. Supporting this claim, Huizinga et al. (1994) found that violent offending occurs much in the same way, with serious violent offenders committing multiple crimes one year, and none the next. The possibility that victims and bullies may alternate statuses across time complicates research and understanding whether one form of aggression is predictive of another. Other research has sought to deconstruct the pathways of aggression.

Investigating the developmental stages of male offending, Loeber, Keenan, and Zhang (1997) conducted the Pittsburgh Youth Study and tested three developmental regression models. Particularly relevant to the current study was the “overt pathway model,” indicating that minor aggression at earlier ages in life, such as bullying and annoying others, leads to the onset of physical fighting, which further leads to the onset of more serious violence during later years in life (Loeber et al., 1997, p.324). Their model implies that involvement in more minor forms of aggression influences involvement in more serious aggression over time. Aggression escalated in seriousness and type in juvenile males’ lives (Loeber et al., 1997). This prior research, however, did not examine the previous victimization underlying this escalation of aggression. Less is known about whether relational victimization contributes independently to physical aggression at a later time. Previous victimization, however, is not the only factor to be considered in establishing this connection.

Description of other Individual and Contextual Variables Related to Aggression

To provide a strong test of the hypothesized relationships between victimization and subsequent physical aggression, it is necessary to consider the individual, social, and environmental factors that also contribute to aggression. Agnew's (2005) integrative theory of crime identifies possible characteristics that are related to aggression. Agnew (2005) categorizes possible concepts that contribute to delinquency into five life domains: the self, family, peers, school, and work. Work was not relevant to middle school students so the current study will instead assess social and physical disorder and pro-social community involvement in students' neighborhoods instead (Wilson & Kelling, 1982).

Agnew (2005) also made note of influencing factors not immediately included in his theory, such as community characteristics, age, sex, and race and ethnicity, which the present study considered. Thus, Agnew's (2005) integrative theory is not tested, but the framework of life domains was used to organize the prior research findings that identified possible control variables. In the proposed research, these characteristics are treated as control variables to rule out alternative explanations for the relationship between victimization and aggression. In addition to Agnew's integrative theory, support for control variables were based on several published studies (Carbone-Lopez, Esbensen & Brick, 2010; Esbensen & Carson, 2009; Farrington et al., 2011; Olweus, 1993).

One such study was a meta-analysis based on 153 studies that identified these consistent predictors of bullying and victimization in childhood and adolescence: externalizing behavior such as aggressive, disruptive and noncompliant actions,

internalizing behavior such as depression and anxiety, social competence, or an individual's social skills and their disposition towards socially unacceptable behaviors, self-related cognitions such as self-respect and self-esteem, social cognitive beliefs about others and empathy, academic performance, family and home environment, school climate, community factors, peer status, and peer influence (Cook et. al., 2003). The findings indicated that the strongest predictors for bully-victims, a category of students who are victimized and aggress towards others, were self-related cognitions and social competence (Cook et al., 2003). For bullies, they were aggressive and defiant behaviors and attitudes towards others. For victims, they were school climate, peer status and social competence.

In addition, as part of understanding the connection between victimization and aggression, my study controlled for anger. Psychological studies (Champion & Clay, 2003; Unnever & Cornell, 2003; Wilkowski & Robinson, 2008) have found individual differences in trait anger, one's propensity to respond with anger when frustrated. The importance of anger as a mediating variable between relational victimization and subsequent physical aggression has also been noted in Agnew's strain (1992) and integrative (2005) theories. The current study's control variables were further supported by previous research utilizing the same dataset.

Prior research (Carbone-Lopez et al., 2010; Esbensen, 2009; Melde & Esbensen, 2011; Melde, Esbensen & Tusinski, 2006; Slocum, Taylor, Brick & Esbensen, 2010) utilizing the same dataset as the current study did not examine the relationship between physical or relational victimization and subsequent aggression. These previous studies

examined the effects of perceptions of victimization, school environment, self-worth (Esbensen & Carson, 2009) and the consequences of indirect and direct bullying (Carbone-Lopez et al., 2010). Esbensen and Carson (2009) examined the consequences of victimization from general bullying (have you been bullied, yes or no) and from a more specific measure combining items asking if students were attacked or threatened, made fun of, subject to mean rumors or sexual jokes. Victims reporting two or more instances of such bullying during at least two out of the three data waves reported lower self-esteem, lower self-efficacy, less use of conflict resolution skills, a lower commitment to school, a less safe school climate, greater empathy, greater commitment to negative peers, and a greater perceived risk of victimization (Esbensen & Carson, 2009). In studying the psychological and social consequences of bullying victimization, Esbensen and Carson (2009) did not examine aggression as a consequence. They also did not include separate measures for relational and physical victimization, as Carbone-Lopez et al. (2010) had done, in their study on the correlates and consequences of indirect and direct forms of bullying by gender.

Carbone-Lopez et al. (2010) found that direct intermittent victimization¹ increased the chance of subsequent delinquency for both boys and girls at the six month data

¹*Intermittent victims and repeated victims* refer to the victimization typology used by Carbone-Lopez et al. (2010, p. 336-337). This typology was constructed as follows: First, the items for each of the two measures, direct and indirect bullying, were summed within wave one and wave two. The third data wave was not included. Then, the sums from each wave were combined into one score for direct bullying and one score for indirect bullying. So, the composite measures for each type of victimization accounted for two data waves. This composite measure was used to create the victimization typology, consisting of three victimization categories based on frequency: *no bullying* victimization (at any of the two waves), *intermittent victims* (students who reported many instances of bullying, either during only one data wave, or those who experienced bullying once

collection (wave two), and relational intermittent victimization increased the chance of delinquency at wave two only for boys. Carbone-Lopez et al. (2010) created victimization measures by summing across only two of the three waves (one and two), and thus precluded the ability to discern between whether victimization came before the delinquency. By omitting data from the follow up wave (three), the researchers were unable to determine the stability of specific victims and address this issue in middle schools. The consequences of direct and indirect bullying were unknown at the follow up data set (wave three), and any temporal links were masked by the summed victimization typology. Delinquency was measured by combining items for both violent and non-violent behaviors such as skipping class, stealing, lying, selling drugs, and hitting people. These behaviors vary in seriousness, so using a general measure did not reveal which types of delinquency are most associated with indirect and direct victimization. This leads to other issues with these dependent variables.

Carbone-Lopez et al. (2010) used only a two item measure for direct forms of victimization, asking if students had been attacked or threatened in school, or on the way to school. This measure did not consider individuals who experienced serious forms of victimization such as being threatened by a weapon, which the current study will include. The current study used the same three items as Carbone-Lopez et al. (2010) to construct a measure for relational aggression, asking if students were the target of social exclusion, gossip and rumors, and sexual jokes. Their study also did not include several important

during each wave), and *repeat victims* (those who were bullied two or more times during both data waves).

control factors in the students' lives such as disorder in the community, risk-taking tendencies, parental supervision, positive social involvement, and the support of deviant norms. In the current study, using Agnew's (2005) theory as an organizational framework for the control variables improved the interpretation of the results, and the identification of potential confounding effects within the proposed models.

CHAPTER THREE

CURRENT STUDY

The current study addressed the limitations identified in previous research, including research using the same data analyzed in the current study, the “Outcome Evaluation of the Teens, Crime, and the Community/Community Works (TCC/CW) Training Program, 2004-2005 (Carbone-Lopez et al., 2010; Esbensen & Carson, 2009). This study used a wider range of measures of physical victimization and a wider range of physically aggressive behaviors, including hitting others and carrying weapons for violent purposes. It avoided summing across waves and examines how victimization in wave one affects aggression in both waves two and three. The current study used a measure targeting only physical aggression, which will provide an opportunity to more accurately establish a link between relational and physical victimization and subsequent physical aggression, rather than multiple forms of delinquent behaviors.

In addition, specific physical aggression as a consequence of relational victimization was not included in these prior studies. Instead of summing victimization categories across waves as previous studies had done, this study instead examined patterns of victimization using zero and one time (non-victim), and two or more times (repeat victim) as the victimization categories. This provided a better picture of when minor victimization escalates to more serious violence at a later time, and will allow confidence that the victimization occurred before the self-reported physical aggression.

Addressing the limitations of these prior studies, the current study extended the field's understanding of the independent effects of relational and physical victimization on subsequent physical aggression. By disentangling the effects of physical aggression and relational victimization on subsequent physical aggression, more tailored and effective school interventions may be created to address the resulting negative effects that children experience. Prior research found some gender differences in the relationship between relational victimization and delinquency (Carbone-Lopez et al., 2010), but research findings in this area are inconclusive and Agnew's theories apply to both boys and girls. Research has generally found that girls and boys have similar predictors for violence (Carbone-Lopez et. al, 2010; Cullen et al., 2008).

Hypotheses

The study tested the following hypotheses:

1. After controlling for other predictors, relational victimization and physical victimization at wave one will both uniquely increase the likelihood of physical aggression at six months (wave two).
2. After controlling for other predictors, relational victimization and physical victimization at wave one will both uniquely increase the likelihood of physical aggression at one year (wave three).

Methods

Sample

In 1985, the Teens, Crime, and the Community/Community Works (TCC/CW) training program was developed as a national effort to reduce adolescent victimization by

focusing on topics of guns, violence, substance abuse, community role models, and community projects. The following study will conduct a secondary analysis on these data Esbensen (2009) originally collected to assess this program's implementation and effectiveness. Out of 250 schools that administered the program, 18 claimed to have fully adhered to protocol standards. Fifteen of these schools participated in the evaluation. Out of these, ten schools were located in Arizona and New Mexico, three schools were in South Carolina, and two schools were in Massachusetts. A total of 1,686 students representing 98 classrooms were surveyed three times using pre-tests during Fall 2004 (Wave 1), post-tests in Spring 2005 (Wave 2), and a one-year follow-up survey in Fall 2005 (Wave 3). Data retention rates for the three waves were 96%, 89%, and 72% (Esbensen, 2009). The current study utilized data at all three waves to test the proposed hypotheses.

Measures

Measurement of independent or predictor variables

Students were asked how many times (0, 1, 2-5, 6-10, and more than 10) during the past six months they had "mean rumors or lies spread about them at school," "had sexual jokes, comments or gestures made to them," or had been made fun of at school because of their looks or the way they talk" (Carbone-Lopez et al., 2010). Although unable to capture all forms of relational victimization previously discussed (Archer & Coyne, 2005), this measure included many different types of relationally aggressive behaviors. For the current study, responses to these questions were used to create a dichotomous variable of relational victimization measuring whether the individual was victimized zero

or one time (=0) (56.2%), or was victimized two or more times (=1) (43.8%). Preliminary analyses indicated that one time was not different from zero times, but it was different than two or more times. Therefore, the final measure is dichotomous.

Physical victimization at wave one was measured by items asking students how many times (0, 1, 2-5, 6-10, more than 10) the following has happened to them in the past six months: “been attacked or threatened on the way to or from school,” “been attacked or threatened at school,” “been hit by someone trying to hurt you,” “had someone use a weapon to force to get money or things from you,” “been attacked by someone with a weapon or by someone trying to seriously hurt or kill you.” For the current study, responses to these questions were used to create a dichotomous variable of physical victimization measuring whether the individual was victimized zero or one time (=0) (77.8%) or was victimized two or more times (=1) (22.2%).

Measurement of Dependent or Outcome Variables

The dependent variables were physical aggression at waves two and three, which was measured using three items at each wave asking how many times (0, 1, 2-5, 6-10, more than 10) in the past three months students had “hit someone with the idea of hurting them,” “attacked someone with a weapon,” and “used a weapon or force to get money or things from people.” For the current study, responses to these questions were used to create a dichotomous variable of physical aggression measuring whether the individual did not engage in physical aggression (=0) or engaged in physical aggression one or more times (=1). At wave two, 62.9% of respondents indicated no physical aggression in the previous three months and 37.1% of respondents indicated at least one incident of

physical aggression in the previous three months. At wave three, 72.1% of respondents indicated no physical aggression in the previous three months, while 27.9% of respondents indicated at least one incident of physical aggression during the same time period.

Measurement of Control Variables

Agnew (2005) elaborated on specific traits and factors that represent the five life domains identified in his integrative theory. The self-domain is a category encompassing individual level beliefs, attitudes, and emotions. The family domain highlights the respondents' relationship with their parents, specifically parental supervision and monitoring. The school domain refers to experiences and attitudes related to school. The peers domain highlights what kinds of friends the respondent associates with, specifically whether they belong to a gang or not. Lastly, the community and disorder domain represents contextual factors that may influence the outcome of aggression, specifically if respondents live in areas with crime, and how active they are in their communities.

Controlling for these individual differences at wave one helped disentangle the effects of relational and physical aggression, because they affect crime as well (Agnew, 2005). Several scales measured individual traits and beliefs, as well as social and environmental factors. Unless indicated below, respondents answered each item in the form of a five category Likert scale: 1) strongly disagree, 2) disagree, 3) neither agree nor disagree, 4) agree, and 5) strongly agree. Table 1 below provides the empirically supported predictors in each of Agnew's integrative theory life domains that were used as

controls in the current study. All scales of several items were created by taking the mean of the items, unless otherwise indicated.

Control Variables

Table 1. Operationalization of the control variables across Agnew's life domains

<i>AGNEW'S DOMAINS</i>	<i>CONTROL VARIABLES</i>
Self	Anger Propensity Prior Physical Aggression Risk Taking Scale Norms Supporting Violence Scale Norms Supporting Stealing Scale Norms Supporting Lying Scale Self-Worth Scale Self-Competency Scale
Family	Parental Supervision Scale
School	Attitude About Education Scale School Intimidation Scale
Peers	Gang Involvement
Community and Disorder	Community Disorder Scale Social Involvement Indicators

Anger Propensity

This scale was measured by the following items at wave one: "I lose my temper pretty easily," "often, when I'm angry at people I feel more like hurting them than talking to them about why I am angry," "when I'm really angry, other people better stay away from me," and "when I have a serious disagreement with someone, it's usually hard for me to talk calmly without getting upset." It is an index measure ranging from 0 to 3 ($\alpha = .79$, $N=1476$, scale mean = 3.01, $SD = .02$).

Prior Physical Aggression

Prior physical aggression was indicated by the same items used in the dependent variables, but measured at time one. The final variable was dichotomous, indicating students who were not physically aggressive (=0, 72.5%) and students who were physically aggressive (=1, 27.5%).

Risk-Taking

This scale was represented by the items: “I like to test myself every now and then by doing something a little risky,” “sometimes I will take a risk just for the fun of it,” “sometimes I find it exciting to do things for which I might get in trouble,” and “excitement and adventure are more important to me than security” ($\alpha=.75$, $N=1,560$, scale mean= 2.70, $SD=.91$).

Self-worth

This scale gauged students’ positive self-perceptions using these items: “I feel that I am a person of worth, at least as much as others,” “I feel good about myself,” “I am a useful person to have around,” “as a person, I do a good job these days,” “I am able to do things as well as most other people,” “when I do a job, I do it well,” “when I make plans I am certain I can make them work,” “failure just makes me try harder,” and “when I decide to something, I go right to work on it” ($\alpha=.79$, scale mean=3.77, $SD=.59$, $N=1532$). Being a victim of either relational or physical aggression can influence a student’s feelings of self-worth. This in turn affects academic performance and outcomes.

Self-competency

This scale was measured by the items: “I feel that I can’t do anything right,” “sometimes I think that I am no good at all,” “I feel that I do not have much to be proud of,” and “I feel that my life is not very useful” ($\alpha = .79$, scale mean= 2.13, SD=.94, N=1589). A factor analysis indicated this measure must be separate from self-worth. It is different than the prior measure and was not consolidated with it because of its more individual level focus.

Norms supporting inappropriate behavior

Three separate scales were used to measure students’ values and acceptance of inappropriate behaviors. *Norms supporting lying* was assessed using the following items: “it’s okay to lie to someone if it will keep you out of trouble with them,” “it’s ok to tell a small lie if it doesn’t hurt anyone,” and “it’s ok to lie if it will keep your friends from getting into trouble with parents, teachers, or police” ($\alpha = .76$, scale mean= 2.68, SD= .96, N=1,593). Adherence to *norms that support violence* was identified by the items: “it’s ok to beat up someone if they hit you first,” “it’s ok to beat up someone if you have to stand up for or protect your rights,” “it’s ok to beat up someone if they are threatening to hurt your friends and family” ($\alpha = 0.76$, N=1605, scale mean=3.37, SD = 1.06). The next scale targeted *norms supporting stealing*: “it’s ok to steal something from someone if they are rich and can easily replace it,” “it’s ok to steal something if that’s the only way you’d ever get it” “it’s ok to take things from a store without paying for them since stores make so much money that it won’t hurt them” ($\alpha = .84$, N=1,595, scale mean=1.67, SD= .79).

Parental supervision

The concept of parental supervision was measured using items about communication and contact with parents including, “when I go someplace, I leave a note for my parents or call them to tell them where I am,” “my parents know where I am when I am not at home or at school,” “I know how to get in touch with my parents when they are not at home,” “my parents know who I am with when I am not at home” ($\alpha=.71$, scale mean=4.02, SD=.80, N=1594). Agnew (2005) noted poor parental supervision is a key family domain variable. Having parents who engage in minimal supervision may lead to overlooking the effects of relational and physical aggression.

Attitude about education

Attitude about education was a six item scale ($\alpha= .79$) based on the following statements: “I try hard in school,” “homework is a waste of time,” “education is important so you put up with things you don’t like about school,” “in general, I like school,” “grades are very important to me,” and “I usually finish homework” (N=1588, scale mean=2.92, SD=.67).

The following two measures are important because they may be indicative of what Agnew (2002, p. 603-604) termed “anticipated” and “vicarious” strain. These strains are defined as situations in which individuals personally believe they will keep experiencing strain, and see or hear about strain occurring to others. A victim of bullying may fear the school environment where their victimization took place or their communities after hearing about gang violence.

Intimidating school

The school intimidation scale assessed students' perceptions of their own safety in school based on their responses to the following items: "I feel like nothing can hurt me when I am at school," "a lot of times, I feel like I have to watch my back when I am at school," "I sometimes cannot concentrate at school because I just don't feel safe," "at this school, you never know when someone is going to threaten you" ($\alpha=0.70$, scale mean= 1.27, SD= .84, N=1593).

Gang involvement

Gang involvement was assessed by two single item dichotomous measures measuring responses to the questions: "do you consider your group of friends to be a gang?" (0=No, 92.2%, 1=Yes, 7.8 %) and "if you are not now, have you ever been in a gang?" (0=No, 85.9%, 1=Yes, 14.1%).

Community disorder

A combined measure was used for social and physical disorder in the neighborhood. Respondents were asked to indicate how problematic (1=not a problem, 2=somewhat of a problem, 3=big problem) various issues in their neighborhoods and schools were: "run down or poorly kept buildings in the neighborhood," "groups of people hanging out in public places causing trouble," "graffiti on buildings and fences in the neighborhood," "people on the street begging for money and other things," "buildings or personal belongings being broken or torn up in the neighborhood," "hearing gunshots in the neighborhood," "not enough lights in the streets and alleys of the neighborhood,"

“and cars traveling too fast throughout the streets of the neighborhood” ($\alpha = 0.86$, scale mean = 1.81, SD = .53, N=1532).

Positive social involvement

This was measured by individual items asking students about their involvement in pro-social activities. These were dichotomous measures with 0 indicating no involvement and 1 indicating involvement in pro-social activities. Students were asked if they participated in “school activities or athletics” (0=No, 34.0%, 1=Yes, 66.0%, N=1608), “community activities such as scouts or athletic leagues (0=No, 58.9%, 1=Yes, 41.1%, N=1604),” “religious activities” (0=No, 61.7%, 1=Yes, 38.3%, N=1604) or “their own family activities” (0=No, 21.5 %, 1=Yes, 73.9%, N = 1609) in the past six months. Reliability scores for these measures as a scale were low, so they were assessed as separate measures in the final model.

Other demographic variables

The current study also controlled for gender and the race of the respondent. Gender was coded as a dichotomous categorical variable (1=male, 46.6%, 2=female, 53.4 %). Race was coded with White (28.8%) serving as the reference category among three dummy coded variables: African American (9.9%), Hispanic (46.5 %), and Other (14.8 %).

Analysis Plan

The current study tested the following hypotheses: after controlling for other predictors, relational victimization and physical victimization at wave one will increase the likelihood of physical aggression at six months (wave two) and at one year (wave three).

Before these hypotheses were tested with multivariate statistics, a few relevant research questions were addressed. A series of chi square analyses assessed across three time waves: the stability of physical victimization and relational victimization, and the relationship between relational victimization and physical victimization. As a preliminary test of the hypotheses, chi square analyses tested the effects of relational and physical victimization at time one on subsequent physical aggression at times two and three, controlling for prior aggression at time one. Prior aggression at time one was controlled as it has been a consistently strong predictor of subsequent aggression (Farrington et al., 2011).

Next, as a test of multicollinearity, phi correlations examined the relationships between categorical control variables, and Pearson's R examined the associations among the continuous control variables. According to Agnew's (2005) theory of crime and delinquency, the life domains should be related to each other, as well as to physical aggression. For this reason, all controls were included in the logistic regression models regardless of their statistical significance.

Next, simple logistic regressions were conducted using time one victimization variables to predict time two and time three aggression outcomes, using SPSS Version 20. These models included students with constant levels of aggression, and ensured that the victimization came before the aggression while controlling for prior aggression and other possible predictors. A fixed effects logistic regression, which controls for unmeasured individual differences and measures the effects of victimization on aggression, was also performed in Stata12. However, this model did not disentangle

which came first, victimization or aggression, and may have produced stronger victimization effects due to correlations between victimization and aggression at the same time period. Because the current study was interested in how victimization affects aggression, the logistic regressions were used to test the hypotheses.

CHAPTER FOUR

RESULTS

As previously stated, victimization and aggression have been previously shown to be more dynamic, rather than static life experiences for individuals (Burk et al., 2011; Williford et al., 2011). The present study determined the stability of both physical victimization and relational victimization experiences in this sample of middle school students using chi square analyses. These analyses addressed the question of whether victims at one point in time continue to experience victimization at a later time. Table 2 presents the results for physical victimization.

Table 2. Relationship of physical victimization experiences across time waves.

Physical victimization		Time 2		Time 3	
	Number of times victimized	0-1	2 +	0-1	2+
Time 1	0-1	83.6%	16.4%	86%	14%
	2+	48.2%	51.8%	66.8%	33.2%
	Phi	.340***		.205***	
Time 2	0-1			57.4%	42.6%
	2+			89.5%	10.5%
	Phi			.356***	

***Indicates a significance level of $p < .001$.

Table 2 shows that physical victimization experiences are associated across the three time waves. There was a statistically significant relationship between physical victimization from time one to time two ($X^2(1) = 164.63, p < .0001$), from time one to time

three ($X^2(1) = 47.75, p < .0001$), and from time two to time three ($X^2(1) = 141.89, p < .0001$). Because the current study sought to answer how victimization at time one influences later aggression, the relationships from time one to times two and three are of utmost interest. Most students who had zero or only one (non-victim) prior physical victimization at time one remained free of victimization at time two (83.6%) and time three (86%). However, those students who experienced two or more (repeat victim) physical victimizations at time one showed major shifts. For example, only (51.8%) of repeat victims at time one remained repeat victims at time two, and (33.2%) remained repeat victims at time three.

Another shift was present in the relationship between time two and time three. Of the repeat victims at time two, 89.5% experienced zero or one physical victimization at time three. These findings suggest that physical victimization is not stable across time periods, which is supported by the weak and moderate phi coefficients. The strongest relationship existed between time two and time three physical victimization ($\phi = .356$). Overall, the shifts in physical victimizations across time waves were not stable.

The relationship among relational victimization across time waves is presented in Table 3 below. Relational victimization experiences across three time waves were statistically associated with one another. There was a statistically significant relationship between relational victimization from time one to time two ($X^2(1) = 300.88, p < .0001$), from time one to time three ($X^2(1) = 139.44, p < .0001$), and from time two to time three ($X^2(1) = 235.42, p < .0001$). The stronger phi coefficients suggested relational victimization was more stable across time than physical victimization. However, there were still shifts in victimization, as neither test of association revealed a strong

relationship with a phi coefficient above .465. For example, the majority of repeat victims at time one continued to be repeat victims at time two (74.7%) and time three (63.9%), and repeat victims at time two continued to be repeat victims at time three (69.2%)

Table 3. Relationship between relational victimization and time wave.

Relational victimization		Time 2		Time 3	
	Number of times victimized	0-1	2 +	0-1	2+
Time 1	0-1	72.2%	27.8%	71%	29%
	2+	25.3%	74.7%	36.1%	63.9%
	Phi	.465***		.349***	
Time 2	0-1			76.5%	23.5%
	2+			30.8%	69.2%
	Phi			.458***	

*** p<.001.

To paint a more complete picture of the victimization patterns overall in the current sample, Table 4 below demonstrates the relationship between relational victimization and physical victimization across the three time waves. It has already been established that relational victimization is more persistent across time than physical victimizations. Now, it is necessary in understanding the relationship between the two types of victimizations. Since relational victimization is often overlooked and more covert than physical victimization (Crick & Grotpeter, 1995), Table 4 presents how physical victimization is related to relational victimization across time waves.

Table 4. Relationship between relational and physical victimization across time.

		Relational victimization					
		Time 1		Time 2		Time 3	
Physical	Number	0-1	2+	0-1	2+	0-1	2+
Time 1	0-1	65%	35%	56.5%	43.5%	59.1%	40.9%
	2+	25.4%	74.6%	32.4%	67.6%	37.8%	62.2%
	Phi	.334***		.197***		.176***	
	X ²	(1) 175.18***		(1) 54.77***		(1) 35.89***	
Time 2	0-1			60%	40%	60.7 %	39.3%
	2+			23.7%	76.3%	32.3%	67.8%
	Phi			.314***		.224***	
	X ²			(1) 144.14***		(1) 67.22***	
Time 3	0-1					59.7 %	40.3%
	2+					27.6%	72.4%
	Phi					.251***	
	X ²					(1) 74.60***	

*** p<.0001.

Relational victimization at any wave was most strongly associated with physical victimization at that same wave, but the relationship is only weak to moderate with the strongest phi coefficient being between physical and relational victimization at time one (phi = .33). These findings suggest that the two forms of victimization are co-occurring at any given wave. For example, the majority of repeat physical victims at time one were also repeat relational victims at time one (74.6%), but the percentage who had physical victimization at time one also had relational victimization decreased at time two (67.6%), and at time three (62.2%). The co-occurrence of these two victimizations across time is fairly stable; however, the strength of this relationship decreases over time. The weak, decreasing phi coefficients from time one to time two (phi=.197) and from time one to time three (phi=.176) indicate that the relationship between relational and physical

victimization diminishes over time. Repeat physical victims at time two were also repeat relational victims at time two (76.3%, $\phi=.314$) and time three (67.8%, $\phi=.224$).

Across time waves, however, there are changes from non-victims to a victim status. Of physical non-victims at wave 1, 43.5% were experiencing repeat relational victimization. The Phi correlations indicated that physical victimization and relational victimization are only modestly, but significantly correlated across time. So, it is possible to disentangle the unique influence of each type of victimization by using these separate measures. At any given wave, about 40% of physical non-victims happened to be repeat relational victims as well. The percent of individuals who are non-victims at time one decreases over time; in other words, over time, individuals' likelihood of victimization due to either physical or relational victimization increases. This suggests that non-physical victims became relational victims. Repeat relational and physical victimization also occur separately. For example, students who only experienced 0 to 1 instances of physical victimization at wave one experienced repeat relational victimization at wave one (35%), wave two (43.5%), and wave three (40.9%).

Preliminary Bivariate Statistical Tests

Next, the hypothesis that both physical and relational victimization would have an independent effect on subsequent aggression at time two and time three were tested with chi square analyses. These analyses controlled for prior physical aggression at time one. It has consistently been identified in the literature as a variable that influences both victimization and aggression (Farrington et al., 2011). Table 5 and Table 6 below present the findings for each independent variable separately.

Table 5. Relationship between relational victimization and subsequent physical aggression controlling for prior aggression at time one.

Prior aggression	Relational victimization	Number of times victimized	Physical aggression			
			Time 2		Time 3	
No			0	1+	0	1+
		0-1	78.4%	21.6%	81.6%	18.4%
		2+	68.2%	31.8%	81.4%	18.6%
		Phi	.113***		.003	
		X ²	(1) 13.12 ***		(1) .005	
Yes		0-1	41.9%	58.1%	59.2%	40.8%
		2+	29.4%	70.6%	41%	59%
		Phi	.125*		.171**	
		X ²	(1) 5.86*		(1) 8.73	

Significance at one tailed $p < .001$ ***, $p < .01$ **, $p < .025$ *

Table 5 shows the relationship between relational victimization and physical aggression was statistically significant at time two for both those with and without prior aggression. Most interestingly, among repeat relational victims who did not report prior aggression, 31.8% indicated physical aggression at time two, and 18.6% indicated physical aggression at time three. Of those students who reported prior physical aggression and repeat relational victimization, 70.6% indicated physical aggression at least once at time two and 59% indicated physical aggression at least once at time three. All phi coefficients are very weak, however, the strongest relationship appears among those who had prior aggression, and physically aggressed at time three ($\phi = .171$). Because this analysis did not include all the control variables, it is possible that these relationships are spurious.

Table 6 shows the relationship between physical victimization and subsequent physical aggression at times two and three. All tested relationships were significant, with the exception of the relationship between those with no prior aggression, and physical aggression at time three.

Table 6. Relationship between physical victimization and subsequent physical aggression.

			Physical aggression			
Prior aggression			Time 2		Time 3	
No	Physical victimization	Number of times victimized	0	1+	0	1+
		0-1	76.8%	23.2%	82.1%	17.9%
		2+	65.5%	34.5%	77%	23%
		Phi	.089**		.046	
		X ²	(1) 8.38**		(1) 1.77	
Yes		0-1	40.9%	59.1%	52.3%	47.7%
		2+	25%	75%	38.9%	61.1%
		Phi	.167***		.133*	
		X ²	(1)10.52***		(1) 5.28 *	

Denotes significance at one tailed $p < .001^{***}$, $p < .01^{**}$, $p < .025^{*}$.

Physical victimization predicted physical aggression for all those with prior aggression, and only those without prior aggression at time two. All relationships were significant, except physical victimization does not predict subsequent physical aggression for those without prior aggression at the one year period. All of the significant relationships are very weak, and they do not possess much explanatory power.

Interestingly, 75% of repeat physical victims with a history of prior aggression reported physical aggression at time two, whereas only 34.5% of repeat physical victims with no prior aggression reported physical aggression at time two. This relationship is weak and

may be spurious due to the lack of controlling for other variables. Although all the phi coefficients are weak, the relationships among those who had previous aggression and who physically aggressed are stronger ($\phi = .167$ at time two and $.133$ at time three). The item for prior aggression asked about aggression occurring in the previous six months. So, aggression occurring within this time frame has a stronger effect on time two aggression than time three aggression. Inferences cannot be made about aggression occurring before that time, or about extraneous variables because they were not included due to the nature of the cross-tabulation analysis.

Relationship Among Control Variables

The current study controlled for several variables representative of Agnew's (2005) life domains: self, family, peers, community, and school. Table 7 displays all the significant relationships among the corresponding continuous control variables. Although very strong relationships did not exist, many moderate relationships existed. This did not create problems in terms of multi-collinearity. The strongest correlation occurred between self-worth and educational attitudes ($r=.482$). In other words, as these middle school students' self-worth increases, their educational attitudes become more positive. Next, moderate relationships exist between supporting lying and risk taking ($r=.45$), and between anger and supporting violence ($r=.45$). Thus, as one's anger increases, so does their tendency to support violent norms. This relationship is of interest, as anger has been noted as a possible mediator to physical aggression (Agnew, 1992). These relationships are also important, as they lend credence to Agnew's (2005) integrative framework and show the dynamic among different aspects of the current respondents' life characteristics.

Table 7. Relationship among continuous control variables.

	CONTROL	1	2	3	4	5	6	7	8	9	10
1.	Risk-taking	1			z						
2.	Disorder	.12	1								
3.	School intimidation	.15	.248	1							
4.	Support lying	.45		.077	1						
5.	Support stealing	.39	.118	.133	.446	1					
6.	Support violence	.39	.117	.168	.368	.381	1				
7.	Parent supervision	-.22	-.077	-.134	-.188	-.332	-.147	1			
8.	Educational attitude	-.38		-.151	-.382	-.447	-.305	.368	1		
9.	Self-competency	.21	.199	.290	.148	.205	.112	-.205	-.279	1	
10.	Self-worth	-.17		-.169	-.205	-.235	-.113	.361	.482	-.401	1
11.	Anger	.39	.181	.270	.305	.278	.45	-.163	-.301	.254	-.176

A Bonferroni adjustment for 20 control variables produced a new p-value criterion of $p < .0025$ ($0.05/20=.0025$) that represents an alpha level of .05 across multiple tests.

Chi square analyses were used to determine the relationships among the categorical control variables. These analyses show many weak to moderate relationships, and again do not create an issue of multicollinearity. All relationships among the categorical variables (race, gender, participation in school or athletics, religious activities, family activities, community activities, identifying as a gang member, and having friends in gangs) were below a phi coefficient level of .44. The strongest relationship appeared between being a gang member and having friends who are in gangs ($\phi=.44$) and between participating in school activities and community activities ($\phi = .357$). These correlations indicate differences in the types of behaviors middle school children participate in during their time away from school. However, these are only bivariate correlations, which do not account for how they influence aggression.

Multivariate Statistics

Logistic Regression

Bivariate analyses showed that relational victimization and physical victimization uniquely contribute to subsequent physical aggression while considering prior aggression in middle school students. Now, the multivariate models will consider the rest of the variables that were lacking in the chi square analyses. Table 8 shows the results for two simple logistic regressions predicting subsequent physical aggression at time two, and at time three.

Time Two Physical Aggression

The model predicting the odds of aggression at time two using relational victimization, physical victimization, and the life domain variables at time one was significant ($X^2(24)=321.502$, $p<.0001$), and explains a moderate amount of the variance in the observed data (Nagelkerke $R^2=.299$). Physical aggression at time two was correctly predicted for 73.6% of the cases. After controlling for the effects of the life domain predictors, the hypothesis that both physical victimization and relational victimization affect subsequent physical aggression at six months was supported. The odds of physically aggressing at time two for relational victims at time one are 1.42 times that of a non-relationally victimized youth and 1.57 times that of a non-physically victimized youth. The odds of physically aggressing at time two for youth with prior aggression are 1.99 times that for youth without a history of aggression.

Table 8. Simple logistic regressions predicting subsequent physical aggression using time one victimization variables.

Time 1		Time 2		Time 3	
Predictors		Wald	Exp(B)	Wald	Exp(B)
Relational victimization		5.58	1.42*	.042	1.04
Physical victimization		6.75	1.57**	.05	1.04
Life Domains					
Self	Anger	2.31	1.14	2.32	1.16
	Prior aggression	56.74	3.30***	35.78	2.93***
	Risk taking	4.54	1.21*	4.76	1.26*
	Support violence	7.68	1.25**	.38	1.06
	Support steal	4.82	.80*	1.43	.87
	Support lying	7.25	1.25**	4.02	1.12*
	Self-worth	.71	1.13	.04	1.03
	Self-competency	2.90	.96	.05	1.02
Family	Parent supervision	.87	1.1	.007	1.01
School	Educational attitude	.89	.88	.77	.88
	School intimidation	.003	.99	3.54	1.22
Peers	Gang friends	1.26	1.37	.74	1.30
	Gang membership	10.58	1.99***	6.44	1.86**
Community & Disorder	Disorder	7.76	.69**	.001	1.01
	Religious activities	.00	1.00	.15	1.07
	Community activities	.08	1.04	.13	.94
	Family activities	.18	.93	1.93	1.31
	School activities	.10	1.05	1.06	1.21
	Race	11.6***		5.274	
	African-American	11.45	2.28***	4.38	1.78*
	Hispanic-American	1.41	1.23	2.41	1.36
	Other Races	1.65	1.32	.20	1.12
	Gender	1.18	.86	8.25	.63**
Model Statistics	Constant	5.64	.16	6.76	.09*
	X ²	321.502***		196.624***	
% Correctly Predicted	Total	72		76.5	
	Non-aggressive	87.40		92.1	
	Aggressive	45.2		36.7	

***Significant at one tailed p<.025 level for the predictors and at p<.05 for the controls variables.

There were some noteworthy significant controls for physical aggression at time two as well. For every one unit of increase in the risk taking scale there is an increase of 21% in the odds of physically aggressing. All three predictors concerning adherence to socially unacceptable norms were significant in the model predicting time two aggression. For every one unit increase in the supports lying scale, there is an increase of 25% in the odds of physically aggressing at time two. For every one unit increase in the supports violence scale, there is an increase of 25% in the odds of physically aggressing. For every unit of increase in the supports stealing scale, there is a 20% decrease in the odds of physically aggressing at time two. A unit of increase in the social and physical disorder scale decreases the odds of physically aggressing by 31%. Middle school students who are African-American are 2.28 times more likely than Caucasian students to physically aggress at time two. Hispanic and other races were not significantly different from Caucasians on their propensity for aggressing at time two. These results indicate that various life domains are influential in predicting physical aggression for relationally and physically victimized middle school students.

Based on the Wald statistic, it appears that prior aggression (Wald=56.74) contributes more to the model than any of the other predictors. Following this variable, the two strongest contributors to the model are race (Wald=11.45) and gang membership (Wald=10.58). So, when predicting aggression at time two, the most influential life domains are the self and school related variables.

Time Three Physical Aggression

The model predicting the odds of aggression at time three using relational victimization, physical victimization, and the corresponding life domain variables at time one was significant ($X^2(24)=196.624$, $p<.001$), and explains 24.4% (Nagelkerke $R^2=.244$) of the variance in the observed data. The physical aggression at time three status was correctly predicted for 76.5% of cases. Relational and physical victimization at time one did not have a significant effect on physical aggression at time three in this model. The hypothesis that both types of victimizations would affect aggression one year later was not supported.

Based on the Wald statistic, prior aggression (Wald=35.78) contributes more to the model than any of the other predictors. However, it is important to note that the prior aggression variables only measures self-reported aggression for the past six months at time one. Therefore, no inferences can be made about aggression occurring more consistently throughout a middle school child's life. Following this variable, the two strongest contributors to the model are gender (Wald=8.25) and gang membership (Wald=6.44).

After controlling for the effects of the other life domain predictors, the odds of physically aggressing at time three for gang members are (86%) greater than for non-gang members, 2.93 times more likely for youth with a history of prior aggression versus youth without prior aggression. For every one unit increase in the risk taking scale, there is an increase of 1.26 in the odds of physically aggressing at time three, and for every one unit of increase in the support lie scale, there is an increase of 1.26 in the odds of

physically aggressing at time three. The odds of physically aggressing at time three for females are .63 times lower than for males. Overall, race did not have a significant effect on physical aggression at time three.

Fixed Effect Logistic Regression

A fixed effect logistic regression was used to account for individual level variation and aggression changes among individual subjects across the three time waves. This model dropped 1,186 cases from the analysis for aggression because they did not change across time; so, a total of 500 cases and 1,354 observations were included in the analysis.

Because a fixed effects model already accounts for constant, non-varying variables, race, gender, and gang membership (as determined by the initial model) were not included in the analysis. For all other control variables, the measures at time one, two, and three varied across time and were included in the model. Fixed effects regression controls within individual differences, accounting for unmeasured variables that may vary across individuals. Table 9 shows the results of this model.

Overall, the fixed effect logistic regression model predicting aggression was significant ($X^2(19) = 166.29, p < .0001$). Significant predictors included both of the independent variables, physical victimization and relational victimization, anger, supporting violent norms, supporting stealing norms, and having friends who are in gangs. The strongest predictor in the model was having friends who are gang members.

Table 9. Fixed effect logistic regression predicting physical aggression.

Model Statistics			
Likelihood Ratio (X^2)		166.29***	
Log Likelihood		-406.96	
Number of Groups		500	
Observations		1,354	
Predictors		Odds Ratio	SE
Relational Victimization		1.72**	.30
Physical Victimization		2.06***	.37
Life Domains			
Self	Anger	1.52***	.16
	Risk taking	1.20	.14
	Support violence	1.48***	.16
	Support Steal	1.47***	.18
	Support Lying	.98	.11
	Self-worth	.78	.15
	Self-competency	.92	.10
Family	Parent supervision	.91	.12
School	Educational attitude	.82	.13
	School intimidation	.98	.11
Peers*	Gang friends	2.30*	.69
Community & Disorder	Disorder	.98	.20
	Religious activities	1.04	.20
	Community Activities	1.11	.20
	Family Activities	.94	.18
	School Activities	.99	.18

***indicates a p-value of .0001, **p<.01, *p<.05. For the main independent variables, a one sided p-value of .025 was used.

The fixed effect logistic regression model did not adequately answer the hypothesis because it was not able to discern between time waves, and whether victimization had occurred before aggression. It did show that relational and physical victimization independently predicted aggression. In relation to the simple logistic model,

the stronger effects of the fixed effect model may be attributable to co-variation within the three time periods.

CHAPTER FIVE

DISCUSSION

The current study tested two hypotheses of whether relational and physical victimization at wave one independently influenced physical aggression six months and one year later. Both relational and physical victimization independently increased the likelihood of physical aggression at wave two, but had no significant effect on physical aggression at wave three. At wave two, the supported findings occurred after controlling for plausible alternative hypotheses supported in the literature and in Agnew's (2005) integrative theory. The findings suggest that victimization has more immediate effects than longer term effects on aggression for middle school children.

While previous research has provided mixed support for aggression following victimization, the current study accounted for several previous limitations (Agnew, 2002; 2006; Wallace et al., 2005). The current study design included a better assessment of the control variables, more complete measures of physical victimization and physical aggression, and more confidently determined that victimization occurred before the aggression than previous studies (Carbone-Lopez et al., 2010; Esbensen & Carson, 2009). The bivariate analyses included an additional component, prior physical aggression, which revealed that victimization came before aggression among those who had reported prior aggression and those who had not reported prior aggression. Previous research has

also not assessed the independent effects of relational and physical victimization on aggression.

Methodologically, both the simple and fixed effects logistic regressions supported that relational and physical victimization contributed to subsequent physical aggression. The simple logistic was able to show that the effects of victimization were confined to the first six month period and did not continue at the 12 month data collection. The fixed effect logistic regression controlled from unmeasured individual differences as it examined changes within individuals for only the 500 students who changed their aggression patterns across the three time periods. The effects for relational and physical victimization were stronger in the fixed effect regression, but this may be explained by the correlation between victimization and aggression within the same time period (as shown in the previous chi-square analyses). The fact that relational and physical victimization had significant and independent effects in both the simple and fixed effects logistic regressions provides more confidence that relational victimization contributes to subsequent aggression beyond its association with physical victimization.

Additionally, the study tracked the stability of the two types of victimization, and their association among one another. Overall, relational victimization was somewhat more stable across time than physical victimization, as indicated by the stronger phi coefficients. When assessing the relationship between both types of victimization across time, the analyses indicated an overlap between physical and relational victimization; victims of one form were also usually victims of the other form. A percentage of relational victims were also physical victims, and a percentage of physical victims were

relational victims within each separate time wave. So, while taking into account both forms of victimization, the study still isolated independent effects in relation to subsequent physical aggression, while factoring in the effects of several control variables based on Agnew's (2005) life domains.

Simple logistic regressions provided insight into how the life domains contributed to the hypothesized relationship between relational and physical victimization and subsequent physical aggression. Significant control variables in the simple logistic regression were prior aggression, support of violent norms, support of stealing norms, risk-taking, gang membership, race, and disorder. The control variables most strongly contributing to the model were prior aggression and gang membership. These are all high risk factors in an adolescent's life that may be addressed prior to an outbreak of aggression (Farrington et al., 2011).

Theoretical Implications

The current study has important theoretical contributions. Agnew's (2005) life domains represent social and individual traits in a person's life, which are influenced by age and other demographic factors. For middle school students, the most influential traits in understanding the outcome of physical aggression were prior aggression, support of violent norms, support of stealing norms, and having friends that were gang members; so, the most prevalent domains were the self and peer domains. Traits indicative of individual states of mind and behaviors, and having to do with their peers were more influential in explaining victims' physical aggression at a later time than the other domains representing community disorder, family, and school.

Based on the current findings, interpersonal relationships have greater influences on physical aggression than the community, parental supervision, or an intimidating school environment. If Agnew's (2005) theory does in fact hold true, then these influences would shift to other domains as the middle school children got older. Because the other control variables had very little significance in the model, researchers should focus more on understanding more about these influences within the relationship between victimization and aggression. More research need to be conducted using Agnew's integrative theory to disentangle the effects of the domains in school bullying, as well as other crimes and violent behaviors.

The supported hypothesis validates Agnew's (1992) strain theory. Although relational victimization is less noticeable, and harder to detect than physical victimization, both forms may contribute to strain, or a state of frustration inciting negative reactions such as fear and anger, which may in turn lead to various coping mechanisms, including physical aggression (Agnew, 1992; Crick, 1996; Nui et al., 2008). The current study did not address whether these negative reactions occurred, however, it was able to confirm the link between prior victimization and subsequent aggression (Farrington et al., 2011). Agnew (2002) argued that strain and responses to strain are subjective experiences; student experiences with victimization and aggression are also differently perceived by both victims and aggressors. For example, following victimization, students have been documented to feel angry, scared, depressed, vengeful, and sad (Pronk & Zember-Gembeck, 2010; Wallace et al., 2005).

On the other hand, it is possible that students did not perceive their victimization, especially relational victimization as aggressive or offensive. This is especially true regarding relational victimization because students may think of their victimization as part of the cultural and social environment of middle school. As evidenced by the current findings, there were instances when this relational aggression resided more profoundly with the students who were aggressive at a later time. Researchers must ask themselves the question of what made these students different from students who do not perceive insults and social exclusion as aggressive.

This question is an important one, as it presents certain conceptual and methodological implications. As shown in the current study and previous studies using the same dataset, relational victimization and physical victimization have serious negative implications (Carbone-Lopez et al., 2010; Esbensen & Carson, 2009). Particularly in the case of relational victimization, students may not perceive it as aggressive. They may perceive it as part of the everyday school environment and culture that they just deal with. On the other hand, there are students who internalize this victimization and react to it. These are the students that have been dealing with such victimization for longer periods of time, and react negatively to it.

Relational victimization was indicated in the current study as student who reported zero or one instance of victimization, and students who reported two or more instances. Items representing relational victimization included being the subject of “mean rumors or lies spread about them at school,” “had sexual jokes, comments or gestures made to them,” or had been made fun of at school because of their looks or the way they

talk.” In the original survey data, students answered questions about the number of times they were victimized in increments of zero, one, two to five, six to 10, and 10 or more. Initial analyses in the current study showed no differences between the students who reported two to five instances of victimization, and those who reported six to 10 instances, or 10 or more instances. So, this measure represents students who did not just experience one hurtful insult or remark from another student, but students who keep experiencing this kind of victimization. These forms of relational aggression also go beyond regular, every day remarks from students. They are more hurtful because they threaten a student’s access and standing in a peer social network, and reputation.

Policy Implications

The current study’s findings also have many policy implications, which include a call for more action to be taken by school administrators and students at middle schools. Victimization and aggression have been noted to occur in patterns, so it is important to think about the findings in this context as well (Burk et al., 2011; Williford et al., 2011). For example, relational and physical victimization contributed to subsequent aggression at time two but not time three. Many times, victims of one form of aggression were also victims of the other. In addition, relational victims and physical victims with prior aggression were associated with later physical aggression. Although the current study did disentangle these effects, it is possible that these findings may be embedded within a much more complex pattern. This possibility complicates school policies in addressing school victimization.

A finding of the study was that relational victimization was associated with physical victimization at any given wave. This makes it difficult to isolate the trigger point, or root of the physical aggression. The current study showed that victimization is this trigger, however, it cannot make claims about what students felt or why they aggressed. What actually made the student aggress against another student? In the current study, it was repeat victims; in other words, victims who reported two or more instances of victimization. They have been experiencing victimization repeatedly over time. The current study assessed the number of times students were relationally and physically victimized and physically aggressed, so it cannot suggest specific policy action to be taken towards all instances.

This leads to another important question about whether the presence of victimization in schools is still harmful, even if students do not perceive it as being so to themselves. This must be considered within relational aggression, that is usually less noticeable and less outwardly aggressive. Because relational victimization is associated with physical victimization, as shown in the chi square analyses, to let relational victimization go unaddressed may mean that physical victimization is unaddressed as well. School administrators would benefit most from identifying the repeat victims of relational aggression or physical aggression, rather than trying to prevent all types of victimization. Based on the current study, administrators should pay attention to students faring negatively in the most significant life domains of the model, which are gang membership and adherence to socially unacceptable norms.

Limitations

The current study has some methodological and conceptual limitations. The study was based on self-reported measures by students in 15 middle schools in the United States. The study only used Agnew's life domain framework as an organizational tool and did not test the actual theory.

First, a few things must be mentioned about the measures used for relational and physical victimization. Because the dataset asked students about the number of times they had been victimized, it did not gather information about their perceptions concerning their victimization. It is possible that students who reported these instances of victimization did not actually think of them as aggressive or acts of bullying. This must be taken into account when mentioning implications for school victimization and anti-bullying programs. This begs the question of whether objective relational victimization that is not perceived as such should be addressed. There are students who do not internalize these interactions with their peers, while others do.

A weakness of the current study is that it is based on self-reported measures that would not account for these differences. The answer to this question requires a different methodological approach such as observation (Pellegrini, 1998) or mixed methods. For example, a study by Cullerton-Sen & Crick (2005) showed that in addition to self-reported student data, information about relational and physical victimization from teachers and peers provided a more holistic understanding of these experiences instead of only considering one of them. Data collection from each type of respondent (victim,

teacher, and peers) contributed unique perspectives to understanding victimization experiences.

For example, the current study used data only from one school year for children aged nine to 12, who attended 15 different schools across the United States. Most of these schools, however, were located in the Southwest, so findings may not be generalized to middle schools across the United States. Because victimization and aggression statuses may change across time, it is important to realize that this relationship may be true only at this point in the respondents' lives. Future research would be needed to assess if it is part of a continuing pattern, or the start of a new pattern of victimization and aggression.

In Agnew's (1992) strain theory, victimization is seen as a source of strain, and may produce several reactions such as anger and insecurity that may contribute to subsequent aggression. The current research used Agnew's life domain framework to identify relevant factors, but did not test the actual theory. Using Agnew's (2005) theory as an organizational framework for the control variables improved the interpretation of the results, and the identification of potential confounding effects within the proposed models. The models included seventeen control variables, and assessed concepts potentially related to aggression in the self, family, school, and community domains. Though this study controlled for prior aggression, risk taking, anger propensity, self-esteem, self-competency, and norms about lying, stealing, and violence, it did not consider lack of empathy, a potential factor in the onset of physical aggression. Empathy is defined as "the action of understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another of either

the past or present” (Merriam-Webster, 2013). Particularly in the commission of relational aggression, students need to have an understanding of other students’ emotions, as this type of aggression requires a degree of social intelligence and manipulation (Nui et al., 2008).

According to Agnew’s (2005) integrative theory, two criminals may commit the same crime, but may react differently to the victims’ experience. For example, one person may have high empathy and anticipate their victim’s reaction to their crime, but they may also enjoy committing the crime. This may be the case in the event of school victimization and aggression, which occurs in a context of bystanders and cliques in schools. Therefore, middle school students with low score of empathy, and high scores of empathy, may both physically aggress against another student. While the current study did not consider empathy, it did consider whether students adhere to norms supporting violence, lying, and stealing. Support for these norms may be related to a lack of general concern for others, and less propensity to be able to take the perspective, cognitively, or emotionally, of their peers who may have been relationally or physically aggressive toward them.

The findings for whether empathy reduces aggression are mixed, due to both methodological and conceptual concerns. In a meta-analysis assessing questionnaire empathy measures in 35 studies, Jolliffe and Farrington (2004) discussed the challenges of using a measure of empathy in understanding offending and aggression. They concluded that empathy is a multidimensional concept, and its effects vary by how it is measured. Other research has found that empathy, measured as perspective taking,

contributed to interpersonal aggression (Richardson, Hammock, Smith, Gardner & Signo, 1994). A measure of empathy as perspective taking was not available in the current dataset, and so this concept was not assessed.

Future Research

The distinction between physical and relational aggression in research is necessary due to the different natures of these behaviors. It also leads one to consider whether specific types of victimization, within relational and physical victimization, have independent influences on physical aggression. In other words, are researchers asking the right questions to account for these types of victimization? With rapid technological advancement, relational victimization is present in the cyber world. For example, the current study considered three types of relational victimization, but this does not account for all the forms of relational victimization identified by Archer and Coyne (2005). Although the current study included only three measures, future studies should consider additional forms of relational aggression, and assess whether different forms have different effects on subsequent physical aggression. It is possible that within the combined measure of relational victimization used in the study, one form of relational victimization may have contributed more to physical aggression than other forms.

Victimization specific to each life domain should be tested using the same models as the proposed study, to determine whether they contribute to relational aggression or physical aggression. For example, students may be victimized by peers in school, siblings, family, and people in the community, and all of these forms of victimization may produce the same negative emotions. Future research is needed to assess whether

victimization from different groups produce similar feelings, and whether a more holistic approach is necessary in dealing with them. The current study was unable to account for all of these possibilities. Prior research, however, suggests that victimization effects accumulate. For example, Agnew (2002) found that delinquency was higher among students who experiences family, school, and neighborhood strain. Relational and physical victimization may act as mediators between strain and physical aggression at a later time. This would help explain the importance of context in the development of aggression from victimization, and contribute to more evidence for integrative criminological theories in explaining violent behaviors. Future research may provide a more accurate understanding of existing problems and where to focus attention and resources.

Studies have found support for victimization increasing negative emotions that lead to aggression (Hay & Evans, 2006; Kochenderfer-Ladd, 2004). Kochenderfer-Ladd (2004) found that following combined physical, verbal, relational, and general peer victimization elementary school kids reported feeling scared, embarrassed, upset, and angry. Anger was the most common response, which most commonly elicited aggressive retaliation (Kochenderfer-Ladd, 2004). When testing strain theory in the context of violent victimization and delinquency, Hay and Evans (2006) found that physical victimization first increased delinquency. Then, that victimization was related to a small significant increase in anger, which was later significant with delinquency (Hay & Evans, 2006). These studies show that claiming a direct link between types of aggression fails to consider the interaction of personal and social effects following victimization. Agnew

(2005) accounted for this aspect by elaborating on how these personal and social factors, or life domains, affect the commission of crime. To more fully test Agnew's (2005) integrative theory in relational and physical victimization and aggression, the mediating relationships of all the domains should be tested, as well as triggers and motivations for aggression after victimization.

Agnew (1992) argued that strain leads to negative emotions such as anger, depression, fear, and anxiety. Particularly, scholars have found anger to play a role in victimization and different types of delinquency. Wallace et al. (2005) found that previously victimized students in the 6th, 8th, 10th, and 12th grades were more likely to become angry and frustrated as a result of their victimization. These results demonstrated that physical and verbal victimization accounted for about the same amount of variance in victimization leading to school delinquency. The findings demonstrated a compelling connection between victimization and the elicited negative emotions, which contributed to delinquent behaviors (Agnew, 2006). Further research should examine emotions that underlie bullying and aggression.

Prior research has found mixed support for the mediating role of anger. For example, inconsistent with Agnew's (2006) findings, Moon et al. (2008) did not find a connection between anger and bullying in a sample of Korean students. The researchers suggested this is likely due to cultural differences. Conversely, Moon et al.'s (2010) research is notable because they found low self-control, and anger, to be related to physical bullying. However, physical victimization strongly predicted delinquency, but not school bullying; this study did not measure victimization from relational aggression.

Future studies should further examine if anger is one emotional process underlying the link between victimization and subsequent aggression within a school context. In the current study, anger did not act as a complete mediator because physical and relational victimization showed direct effects at time two.

Conclusion

In conclusion, the hypothesis predicting whether relational and physical victimization have independent effects on physical aggression at a later time was supported. This suggested that these two types of victimization both have unique influences, and should be addressed separately must be addressed separately, before they lead to aggression. The strongest predictors of aggression at six months and one year after victimization were measures of prior aggression, having friends who are in gangs, and supporting norms advocating stealing and violence. Additional research is needed to address the extent to which cultural socialization and external influences compared to victimization experiences contributes to physical aggression in middle school children. A first step in addressing this issue is working toward a better understanding of the forms of victimization that are present in schools and in other domains of students' lives. Once we understand this, we can begin to understand the cultural contexts in an effort to promote cultural change in relation to school violence and victimization.

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